

### EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with James H. Yancey (Reg No: 53,809) on 03/02/2011.

The application has been amended as follows:

**In claims:**

1. A method for establishing peer-to-peer communications by a first user terminal (UT) in a wireless communication system, comprising:  
calibrating with an access point, by:
  - obtaining an estimate of a downlink channel response;
  - obtaining an estimate of an uplink channel response;
  - determining first and second sets of correction factors based on the estimates of the downlink and uplink channel responses; and
  - calibrating a downlink channel and uplink channel based on each of the first and second sets of correction factors, respectively, to form a calibrated

downlink channel and a calibrated uplink channel; and

determining a scaling value indicative of an average difference between the estimate of the downlink channel response and the estimate of the uplink channel response, wherein the estimates for the downlink and uplink channel responses are normalized to account for receiver noise floor; and

establishing direct peer-to-peer communication with a second UT that has also calibrated with the same or a different access point, wherein the establishing is performed without further calibration between the first and second UTs.

10. (canceled)

11. (canceled)

12. The method of claim 1, wherein the determining is performed at a each user terminal.

18. A method for establishing peer-to-peer communications by a first user terminal (UT) in a wireless time division duplexed (TDD) multiple-input multiple-output (MIMO) communication system, comprising:

calibrating with an access point, by:

transmitting a pilot on an uplink channel;

obtaining an estimate of an uplink channel response derived based on the

pilot transmitted on the uplink channel;

receiving a pilot on a downlink channel;

obtaining an estimate of a downlink channel response derived based on the pilot received on the downlink channel; and

determining first and second sets of correction factors based on the estimates of the downlink and uplink channel responses, wherein a calibrated downlink channel is formed by using the first set of correction factors for the downlink channel, and a calibrated uplink channel is formed by using the second set of correction factors for the uplink channel; and

scaling symbols with the first set of correction factors prior to transmission on the downlink;

scaling symbols with the second set of correction factors prior to transmission on the uplink channel; and

establishing direct peer-to-peer communication with a second UT that has also calibrated\_with the access point, wherein the establishing is performed without further calibration between the first and second UTs.

22. (canceled)

23. (canceled)

24. (Currently Amended) A first user terminal (UT) in a wireless time division

duplexed (TDD) multiple-input multiple-output (MIMO) communication system, comprising:

means for calibrating with an access point, by:

obtaining an estimate of a downlink channel response;

obtaining an estimate of an uplink channel response; and

determining first and second sets of correction factors based on the estimates of the downlink and uplink channel responses, wherein a calibrated downlink channel is formed by using the first set of correction factors for the downlink channel and a calibrated uplink channel is formed by using the second set of correction factors for the uplink channel; and

determining a scaling value indicative of an average difference between the estimate of the downlink channel response and the estimate of the uplink channel response, wherein the estimates for the downlink and uplink channel responses are normalized to account for receiver noise floor; and

means for establishing direct peer-to-peer communication with a second UT that has also calibrated with an access point, wherein the means for ~~establishes~~ establishing is performed without further calibration between the first and second UTs.

41. A method for communication in a wireless system, comprising:  
calibrating one or more communication links between a plurality of user stations and one or more access points, based on one or more sets of correction factors derived from estimates of channel responses associated with the one or more

communication links, the plurality of user stations including a first user station and a second user station; and

establishing direct peer-to-peer communication between the first and second user stations using steering without performing calibration between the first and second user stations, wherein the one or more access points includes a first access point associated with a first basic service set (BSS) and a second access point associated with a second BSS, wherein the first user station is calibrated with respect to the first access point and the second user station is calibrated with respect to the second access point, and wherein establishing the direct peer-to-peer communication between the first and second user stations comprises:

sending, from the first user station, a pilot and a request to establish a communication link with the second user station;

sending, from the second user station, a steered pilot and an acknowledgment in response to receiving the pilot and the request from first user station; and

transmitting information between the first and second user stations using steering that is adjusted to compensate for a phase rotation caused by calibration of the first and second user stations with respect to different access points.

42. An apparatus for communication in a wireless system, comprising:  
means for calibrating one or more communication links between a plurality

of user stations and one or more access points, based on one or more sets of correction factors derived from estimates of channel responses associated with the one or more communication links, the plurality of user stations including a first user station and a second user station; and

means for establishing direct peer-to-peer communication between the first and second user stations using steering without performing calibration between the first and second user stations, wherein the one or more access points includes a first access point associated with a first basic service set (BSS) and a second access point associated with a second BSS, wherein the first user station is calibrated with respect to the first access point and the second user station is calibrated with respect to the second access point, and wherein the means for establishing the direct peer-to-peer communication between the first and second user stations comprises:

sending, from the first user station, a pilot and a request to establish a communication link with the second user station;

sending, from the second user station, a steered pilot and an acknowledgment in response to receiving the pilot and the request from first user station; and

transmitting information between the first and second user stations using steering that is adjusted to compensate for a phase rotation caused by calibration of the first and second user stations with respect to different access points.

2. The following is an examiner's statement of reasons for allowance:

Claims 1-9, 12-21, 24, 29-31, 33, 35-37, 39-42 are allowed over prior art.

Claims 10-11, 22-23, 25-28, 32, 34, 38 are canceled.

The prior art fails to teach or in combination render obvious the features as claimed in independent claims,

Claim 1:

"calibrating a downlink channel and uplink channel based on each of the first and second sets of correction factors, respectively, to form a calibrated downlink channel and a calibrated uplink channel; and

determining a scaling value indicative of an average difference between the estimate of the downlink channel response and the estimate of the uplink channel response, wherein the estimates for the downlink and uplink channel responses are normalized to account for receiver noise floor; and

establishing direct peer-to-peer communication with a second UT that has also calibrated with the same or a different access point, wherein the establishing is performed without further calibration between the first and second UTs."

Claim 18:

"determining first and second sets of correction factors based on

the estimates of the downlink and uplink channel responses, wherein a calibrated downlink channel is formed by using the first set of correction factors for the downlink channel, and a calibrated uplink channel is formed by using the second set of correction factors for the uplink channel; and

scaling symbols with the first set of correction factors prior to transmission on the downlink.

scaling symbols with the second set of correction factors prior to transmission on the uplink channel.

establishing direct peer-to-peer communication with a second UT that has also calibrated\_with the access point, wherein the establishing is performed without further calibration between the first and second UTs."

Claim 24:

"determining first and second sets of correction factors based on the estimates of the downlink and uplink channel responses, wherein a calibrated downlink channel is formed by using the first set of correction factors for the downlink channel and a calibrated uplink channel is formed by using the second set of correction factors for the uplink channel; and

determining a scaling value indicative of an average difference between the estimate of the downlink channel response and the estimate of the uplink channel response, wherein the estimates for the downlink and uplink channel responses are normalized to account for receiver noise



floor; and

means for establishing direct peer-to-peer communication with a second UT that has also calibrated with an access point, wherein the means for establishing is performed without further calibration between the first and second UTs."

Claim 40:

"a controller configured to determine, for each of the first UT and the second UT, first and second sets of correction factors based on the estimates of the downlink and uplink channel responses, wherein a calibrated downlink channel for peer-to-peer communication between the first and second UTs is formed by using the first set of correction factors for the downlink channel, and a calibrated uplink channel for peer-to-peer communication between the first and second UTs is formed by using the second set of correction factors for the uplink channel, and the controller further configured to establish direct peer-to-peer communication between the first UT and the second UT without further calibration between them."

Claim 41:

"establishing direct peer-to-peer communication between the first and second user stations using steering without performing calibration

between the first and second user stations, wherein the one or more access points includes a first access point associated with a first basic service set (BSS) and a second access point associated with a second BSS, wherein the first user station is calibrated with respect to the first access point and the second user station is calibrated with respect to the second access point, and wherein establishing the direct peer-to-peer communication between the first and second user stations comprises:

sending, from the first user station, a pilot and a request to establish a communication link with the second user station;

sending, from the second user station, a steered pilot and an acknowledgment in response to receiving the pilot and the request from first user station; and

transmitting information between the first and second user stations using steering that is adjusted to compensate for a phase rotation caused by calibration of the first and second user stations with respect to different access points.”

Claim 42:

“means for establishing direct peer-to-peer communication between the first and second user stations using steering without performing calibration between the first and second user stations, wherein the one or more access points includes a first access point associated with a first basic service set (BSS) and a second access point associated with a

second BSS, wherein the first user station is calibrated with respect to the first access point and the second user station is calibrated with respect to the second access point, and wherein the means for establishing the direct peer-to-peer communication between the first and second user stations comprises:

sending, from the first user station, a pilot and a request to establish a communication link with the second user station;

sending, from the second user station, a steered pilot and an acknowledgment in response to receiving the pilot and the request from first user station; and

transmitting information between the first and second user stations using steering that is adjusted to compensate for a phase rotation caused by calibration of the first and second user stations with respect to different access points."

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

**3.** Any inquiry concerning this communication or earlier communications from the examiner should be directed to VENKATESH HALIYUR whose telephone number is

(571)272-8616. The examiner can normally be reached on Monday thru Friday  
11:00AM to 8:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ayaz Sheikh can be reached on 571-272-3795. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Venkatesh Haliyur/  
Examiner, Art Unit 2476

/Ayaz R. Sheikh/  
Supervisory Patent Examiner, Art  
Unit 2476